The Gender Gap in Higher Education in Europe: The Impact of Individual and National Characteristics

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ABSTRACT

In recent decades, a dramatic shift has occurred in higher education throughout many industrialized societies. For the first time in history, women are completing more education than men in many countries. In this paper, I examine the gender gap in higher education among young men and women in 17 European countries. Using data from the 2004 European Social Survey and aggregate country-level data, I examine how individual's family background and national-level labor market characteristics, marriage and family norms, and women's status affects the gender gap in university completion. I find that for young women, having a father with a university degree and a mother that worked outside the home during adolescence increases their likelihood of completing a tertiary degree compared to men. Additionally, living in a country with higher fertility rates and a more equal share of women participating in the labor market compared to men, increases women's odds of university completion, while it decreases men's odds of completion. Higher divorce rates decrease men's odds of completing a degree, but this negative effect does not exist for women. A larger percentage of a country's labor market that works in the industrial sector decreases both men's and women's likelihood of completing university, but at a greater rate for women than men. These findings contribute to our understanding of both the micro- and macro-level factors that influence the gender gap in university completion across countries.

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The lives of women in Europe and other industrialized societies have changed dramatically in the past several decades. Women now spend more of their adult lives engaged in the labor force. It has become more common for women to delay or forego marriage and childbearing. They are spending more of their adult lives outside of marriage and in non-traditional family forms such as cohabiting unions or as single parents with children. These changes have been noted for some time and demographers and other scholars have made substantial efforts to both describe and explain these multiple and interconnected trends (Dixon 1971; Lesthaeghe 1983; Mason and Jensen 1995; Corijn and Klijzing 2001). Falling rates of marriage, rising rates of divorce and declines in fertility to what some have come to term "lowest low fertility" have been described as constituting the Second Demographic Transition (Lesthaeghe 1983).

Another major change in the lives of women has, until very recently, gone relatively unnoticed: the rapid rise of women's participation in higher education. Today women comprise 55% of all students graduating from tertiary education in EU27 countries. This is a striking reversal from the situation just 30 years ago when in all countries women comprised less than half of the students completing tertiary education in Europe. Furthermore, this trend is projected to continue in the future. By 2015, women are expected to comprise more than 60% of all students in many European countries (Vincent-Lancrin 2008).

The fact that women now comprise the majority of tertiary degree recipients throughout Europe is no doubt related to changes in marriage, childbearing and labor force participation but these relationships are complex and understudied. To date, virtually no research has considered

how rising rates of women's tertiary education link to major changes in family formation and labor force participation in industrialized societies. Moreover, the emphasis on changes and trends *over time* in various aspects of women's status has diverted attention away from the differences *across countries* in these patterns (Kalmijn 2007).

In this paper, I analyze data from the 2004 European Social Survey for 17 countries to examine how national and individual factors determine women's high levels of education, compared to men's, and answer the following questions:

1. **How do individuals' family backgrounds affect women's and men's educational attainment differently?** How does having a highly educated parent affect women's and men's education? How do gender-specific role models within the home affect women's and men's educational attainment differently across countries?

2. **How do national differences in marriage and family norms affect women's educational attainment**? Do norms about family formation and divorce affect women's educational attainment? Do these factors also influence men's educational attainment?

3. **How do features of a country's labor market affect women's and men's educational attainment?** Do features of the labor market, such as unemployment rates and the size of various economic sectors, affect how much education men and women complete in a country?

4. **How do gender role ideology and women's status in society affect women's educational attainment**? Specifically, how do attitudes and expectations about gender roles and women's status in powerful and prestigious positions affect how much education women and men attain?

BACKGROUND

As gender egalitarian norms have taken hold and flourished, attitudes toward women completing more education and pursuing careers, even as they become wives and mothers have become far more common. Across many industrialized countries, younger individuals are more supportive of gender equality than previous generations (Inglehart and Norris 2003). Young women look to their mothers and peers when making decisions about their futures, but they also

are influenced by cultural norms in their country. As more women enter higher education and the workforce, the next generation of women is influenced to desire or expect these outcomes as well. McDaniel (2010) finds that young girls' educational expectations are influenced by the overall gender ideology in their country. In more gender egalitarian countries, girls are more likely to expect to attain a tertiary degree than boys compared to less egalitarian countries. As larger changes occur in society that affect women, including a rising proportion of women in the labor market, lower fertility rates, and higher divorce rates, women's decisions about their education and futures should be affected. Women's overall status in society as well as norms pertaining to family formation should affect the incentives of individual women to pursue higher education.

In his neoclassical micro-economic theory of family change, Becker (1991) argues that the economic division of labor between men and women was the primary incentive to form stable unions. As women's and men's roles have become more similar, this incentive is weakened and marriage declines in importance – as evidenced by a rise in non-marital cohabitation, declining marriage rates, temporal postponement of marriage during the life course and rising rates of divorce. In short, the economic emancipation of women is believed to have produced changes in family organization that have become increasingly common in contemporary industrialized societies (Mason and Jensen 1995:2-3).

In the same vein, human capital theory posits that education is an investment decision. Positive returns to education provide the incentive to make an educational investment. This theory implies that trends in educational returns should produce trends in educational investments. Women's increasing educational attainment is linked to changing incentives for women to pursue a degree. Walters (1986) argued that female gains in college enrollment

between 1952 and 1980 in the United States were largely due to changes in the occupational distribution, but she reached the same conclusion about men's college enrollment gains, which were also substantial during this period. Averett and Burton (1996) and Charles and Luoh (2003) found that women's wage returns to higher education have also increased in recent decades, but men's returns have increased even more rapidly due to declining opportunities for high-wage, male-dominated manufacturing jobs for high school–educated workers. Women's economic incentives to pursue tertiary education have increased in recent decades, but so have men's, so gender differences in wage returns alone cannot explain women's advantage over men in tertiary degree completion in most industrialized societies.

Of course, the returns to higher education for men and women extend beyond returns in the labor market and non-economic incentives may be more important in explaining women's growing share of higher education. DiPrete and Buchmann (2006) analyzed data from the U.S.'s Current Population Survey from 1964 to 2002 and found that the female-favorable trend in college completion is due, in part, to women's rising non-economic incentives. Having a tertiary degree provides women with a higher probability of getting married and staying married, ensures a higher family standard of living, and a greater insurance against poverty compared to men. During a time of changing marital norms, increasing rates of divorce and economic uncertainty for women, the benefits of having a tertiary degree for their life outcomes provided women with a large incentive to pursue higher education.

Drawing on existing theories I develop a comprehensive theory to explain why women and men complete different amounts of education. Given that there is little research on women's tertiary education cross-nationally, I borrow from existing theories of education and gender stratification to build a broad theory explaining women's education. A complex set of factors at

the individual- and national-level determine individual's educational attainment. The purpose of this paper is to outline and test the many possible national and individual factors that determine women's rising tertiary attainment compared to men's around the world. National gender ideologies and women's status determine women's roles within a nation, as countries with more equitable attitudes and beliefs about gender roles should offer women more opportunities. Norms and expectations about marriage and family may also shape whether women see higher education as an appropriate investment. Features of the labor market determine the degree of demand for educated, female workers in a country. Individual's family backgrounds, including their role models within the home, should influence men's and women's educational attainment. Considering the wide range of macro and micro factors in a theory of gender and educational attainment will provide a more comprehensive understanding of the causes of women's rising educational attainment and variations in how much education women and men attain across countries.

Family Background

Most all studies of educational attainment cite family background as a key predictor of educational success, but it is possible that family background influences men and women differently. Traditionally, a family's priority was the education of sons, as sons could more successfully provide for their family later in life (Becker 1991; Rosenzweig and Schultz 1982), but more recently the gender-egalitarian perspective suggests that highly educated parents hold more egalitarian values and put equal priority on educating sons and daughters (Buchmann and DiPrete 2006). Therefore, women coming from highly educated homes should have a greater educational advantage compared to other women. The gender-role socialization perspective argues that girls look to their mothers while boys look to their fathers as they develop

expectations of their future education and careers (Downey and Powell 1993; Powell and Downey 1997). In homes where mother's worked during their daughter's adolescence or had high levels of education, women may have developed higher expectations of their future opportunities and should complete more education.

Marriage and Family Formation

National-level norms pertaining to marriage and family may be important in understanding why women enroll in tertiary education at different levels in different countries. In most European nations, education leads to delays in marriage and the birth of the first child (Blossfeld 1995; Corijn and Klijzing 2001). This is likely because women who are highly educated bear a higher opportunity cost for childbearing. Attaining higher levels of education also usually involves a longer period of schooling during young adulthood, which is the prime stage of the life course for childbearing.

The rise of reliable contraception in the 1960s and 1970s has meant that today women have a great degree of autonomy and control over the timing of fertility and reproductive decision making. Women are now able to prolong childbearing in order to pursue education and careers, which has dramatically altered the ambitions and identities of young women. For example, in the United States, beginning in the 1970s, an increasing number of women began to keep their maiden names after marriage (Goldin 2006). During the same time, women in their first year of college began placing a greater emphasis on their financial success and recognition from coworkers as factors that they believed would be important for their personal life satisfaction, mirroring the responses of young men (Goldin 2006). The occupational aspirations of young women in high school changed as well. Between the late 1960s to the late 1970s, young women at the end of their secondary education increased their aspirations to have

prestigious, high-earning occupations and increased their aspirations to enter into typically male occupations (Shu and Marini 1998). Another large change for women has been their growing ability to combine work and family. As opposed to previous generations of women who had to choose between having a job or having a family, women can now more easily combine having a family and working than ever before (Goldin 2004). These few examples of changes occurring in women's lives during this time highlight the fact that once women gained control of their reproductive destinies, their outlook on life shifted.

Since the 1970s, fertility rates have declined substantially across countries. A great deal of demographic research has focused on the dramatic shifts in fertility rates over previous decades, and concern in Europe over low and lowest-low fertility is mounting (for example, see Billari 2008). These changes, which reflect changing reproductive behaviors, no doubt have had a large effect on other aspects of women's lives. Additionally, cursory evidence suggests that in some European countries that many women are deciding to delay, reduce, or even forego childbearing in order to invest in higher levels of education and pursue careers (Shorto 2008). Given these changes, we expect that fertility rates and the average age that women enter into marriage are related to women's educational enrollment.

In addition to delayed marriage and reduced childbearing, rising rates of divorce comprise another important change in family life over the past 20 to 30 years. In the last several decades, the probability of divorce among married couples has increased in all European countries (Dronkers et al. 2006). The increase in divorce is one of the most visible changes in family life that has occurred in European countries. Historically, scholars have argued that one incentive for women to attend college or university was the marriage returns to higher education (Goldin 1992; Mare 1991; Oppenheimer 1988). In light of rising divorce rates, staying married is

an additional benefit of attending higher education. DiPrete and Buchmann (2006) found the return to getting married and staying married for college-educated versus non college-educated women has increased over time in the U.S., which may partially explain women's rising rates of college completion. Teachman (2002) showed that the bivariate relationship between a woman's education and divorce is negative: her risk drops 6% for each additional year of schooling. In Europe, Harkonen and Dronkers (2006) report mixed findings for the effects of women's education on their risk of divorce. Women with higher education have a higher risk of divorce in France, Greece, Italy, Poland, and Spain. In Estonia, Finland, West Germany, Hungary, Latvia, Sweden and Switzerland there is no relationship between higher education and divorce, and in Austria and Lithuania having higher education reduces the risk of divorce.

Becker (1991) argues that because education improves women's chances in the labor market and their economic independence, but simultaneously decreases the economic gains of marriage, women with more education will divorce more easily than less educated women. Other scholars argue that education improves social, cultural, and economic resources and therefore increases the stability of relationships through successful partner matching or enhanced communication and other skills that make relationships successful (Amato 1996).

Labor Markets

In the past three decades, women's labor force participation has risen dramatically across Europe. Rising gender egalitarianism and the abolition of discrimination practices against women in the labor market gave women more opportunities to work (Goldin, Katz and Kuziemko 2006). In many countries, including Denmark, Finland, the Netherlands, Norway, Sweden and Switzerland, more than 70% of women now participate in the labor force. Despite women's increasing labor force participation, women are still less likely to work than men in

most countries and when women do work, they earn less money than men and work in less prestigious occupations (Charles and Grusky 2004; Blau and Kahn 2003). If women see higher education as an investment in their future careers and financial security, they will be more likely to pursue a degree in a country where there foresee greater payoff to their degree.

Different economic sectors within a labor market demand different levels of educated workers (Walters 1986; Brinton 1993). Also, some sectors are highly sex-segregated, which shapes women's access to jobs (Charles and Grusky 2004). Countries with larger sectors that demand highly educated workers, such as technology sectors, could provide more opportunities for women since a higher overall demand for educated workers may exist. Additionally, in countries with large public service sectors, which tend to be female-dominated and require educated workers, women may complete more education. In contrast, countries with larger male-dominated sectors that require lower levels of education, like the manufacturing sector, may decrease the demand for educated female workers, possibly reducing women's investment in education.

Unemployment rates may also be related to women's share of tertiary education. If unemployment is common, especially amount young adults, individuals may be more likely to pursue higher education as an avenue to avoid unemployment since research shows highly educated individuals are the least likely to be unemployed (Azmat et al. 2006).

Gender Ideology & Women's Status

Attitudes and expectations about women's and men's appropriate roles vary across societies and determine micro-level beliefs and interactions as well as macro-level organizational and structural features of institutions (Risman 2004; Martin 2004). In countries where more

egalitarian gender ideologies prevail, the division of household labor is more equitable among men and women (Fuwa 2004; Geist 2003) and women are more likely to participate in the labor market and politics (Pettit and Hook 2005; Paxton and Kunovich 2003). Some evidence suggests that the spread of more egalitarian gender ideologies across countries is a driving force behind women's increasing educational attainment (Bradley and Ramirez 1996). Therefore, national-level gender ideologies should prove important for how much education women receive relative to men within a nation. Variations in national-level gender ideologies should also determine, in part, cross-national differences in women's educational attainment.

Gender ideologies within a country can also be measured by women's actual status. Research on women in the labor market and politics finds that women's status increases women's participation in these realms (Paxton 2007). Gender ideologies and egalitarian attitudes impact the number of women participating in national legislatures and serve to decrease sex segregation in the labor market (Paxton and Kunovich 2003; Charles 1992). Higher rates of women's labor market participation and government-approved equal rights policies decrease sex segregation in college majors (van Langen and Deekers 2005). Young women may look to women's overall status in society to determine whether investing in a university degree is worthwhile.

DATA AND METHODS

This study uses the 2004 European Social Survey, a cross-national, representative survey of attitudes and opinions of individuals aged 15 and older in 25 European countries.[1] I limit my sample to 25 to 34 year-olds in each country in order to analyze the most recent cohort of men and women that have completed tertiary education. Country-level data were collected for a

[1] Countries include Austria, Belgium, Bulgaria, Cyprus, Denmark, Estonia, Finland, France, Germany, Hungary, Ireland, Latvia, the Netherlands, Norway, Poland, Portugal, Romania, Russia, Slovakia, Slovenia, Spain, Sweden, Switzerland, the United Kingdom and Ukraine.

variety of sources, including the UN Demographic Yearbook, the UN Development Reports, and the CIA World Factbook. All country-level data, with the exception of gender role ideology (to be discussed), were collected for the year 1990 or the most recent year available. Data are from 1990 in order to assess the national-level norms that existed when young men and women during their adolescent years, when they were likely making decisions about their future educations (25 to 34 year-olds in 2004 would be aged 11-20 in 1990). Countries are limited to those with available data at both the individual and country-level, providing a final sample of 17 countries. The United Kingdom, Turkey, Ukraine and Italy are excluded due to missing data at the individual-level or country-level. The Czech Republic, Slovakia (together, the former Czechoslovakia), and Slovenia (former Yugoslavia) were excluded because in 1990 they did not exist as the same country and therefore, country-level data could not be collected.

Dependent Variable

"Completed university education" is the dependent variable in this study. In each country, individuals were asked about the highest degree they had completed. Responses were coded according to the International Standard Classification of Education (ISCED), an instrument designed for reporting education statistics across countries. Individuals were completed ISCED level 5 or 6 (representing vocational or academic tertiary education or higher), were coded as completing university education. Descriptive statistics for the dependent variable, and all other variables, are presented in Table 1.

TABLE 1 HERE

Individual-level Variables

Individual variables include gender (1=female), immigrant status, minority status, age, parent's education, parent's occupation, whether each parent completed university, and whether a

person's mother worked during adolescence. Immigrant and minority status are measured as dummy variables indicating whether a person was born in another country and whether a person considers themselves a minority in their country.[2] Parent's occupation is measured in nine categories, with zero representing not working and eight representing working in the most prestigious occupations when a respondent was age 14. Parent's occupation is derived from the highest occupational level of either parent (or a single parent's highest occupation if data on other parent is unknown). Parent's education is measured using the six ISCED variables, representing from pre-primary education to higher education, as well as a category of zero if parents completed no education. As with parent's occupation, parent's education is derived from the highest level of education completed by either.

To measure if having a same-sex parent that has completed university differently affects young men and women, dummy variables were created to represent whether a person's mother and father have completed university education or more. To assess if having a mother who works during adolescence influences women's decision to earn a university degree more than men's, a dummy variable was created to represent if a person's mother worked outside of the home at age 14.

Country-level Variables

To measure norms about marriage and families, the crude divorce rate and fertility rate are included. Crude divorce rate is measured as the number of divorces occurring during a given year, per 1,000 mid-year total population during the same year. Fertility rates are measured as the average number of children that would be born to a woman over her lifetime.

[2] Individuals born in another country and moved to their current country within the past 10 years were excluded from the analysis in order to assess individuals that have lived in their current country long enough to be affected by country-level norms (excludes less than 2% of sample).

To measure aspects of the labor market that may influence the demand for educated female workers I include measures of the percentage of the labor market that is employed in each of the following three sectors: agriculture, services, and industry (agriculture is reference variable). Countries with greater percentages of workers in agriculture should provide fewer opportunities for women to enroll in tertiary education. Countries with larger service sectors (where women traditionally are employed) should provide greater incentives for women to pursue a degree. To measure competition for jobs, I include the country's unemployment rate. In countries with higher unemployment rates, there may be higher competition for jobs, and having a tertiary degree may be seen as more beneficial, increasing the incentives for individuals to attend university.

To measure gender ideology and women's status, three measures are used: women's labor force and parliament participation, and gender role attitudes. Women's labor force participation and parliament participation are measured as the number of females, as a percentage of males, in the labor force and parliament. This represents women's status relative to men's, and in countries with higher women's status, more gender egalitarian norms should pervade, encouraging women to attend university.

The variable gender role ideology was constructed from a factor analysis of four statements pertaining to gender role attitudes in the ESS. The questions include: women should be prepared to cut down on paid work for the sake of the family; men should take as much responsibility as women for the home and children; men should have more right to a job than women when jobs are scarce; when children are in the home, parents should stay together even if they do not get along. All statements were coded as agree strongly, agree, neither disagree or agree, disagree, and disagree strongly. Higher values equal more gender egalitarian attitudes.

Principal components analysis was used to produce one distinct factor, representing gender role ideology, with an eigenvalue of 1.72. Since younger cohorts of individuals become more egalitarian over time (Inglehart and Norris 2003), I assess the prevalent gender role ideologies that young men and women were exposed to during their childhood and adolescence. To do this, I take the aggregate gender role ideology for 45 to 64 year-olds in each country. This age group represents, on average, individuals 20 to 30 years older than my sample - or their parent's generation.

Gross domestic product per capita (GDPC), measured as per person purchasing power (in U.S. dollars), is used as a control for level of development across countries. Gross tertiary enrollment ratio for all individuals is used as a control for the overall difference in likelihood of attending tertiary education across countries.

Analytic Strategy

To test the effects of individual- and country-level factors across countries, I use hierarchical modeling with Bernoulli logistic regression. Hierarchical modeling is used to allow for the estimation of a model that contains differing levels of analysis, recognizing that individuals are nested within countries. Using only logistic regression when including a second level of analysis could produce biased slopes and standard errors (Raudenbush and Bryk 2002). Since logistic regression is used, the following link function is used to transform the outcome in each model: $\eta_{ij} = \log (\varphi / 1-\varphi)$. Dummy variables (female, immigrant and minority status, if a mother works, and if either parent has completed university) are entered uncentered, to properly estimate the effects of the binary variable. All other variables, at the individual and country level, are entered grand-mean centered. The basic, unconditional model is as follows:

$$\text{Level 1}: \ \eta_{ij} = \ln\left(\frac{\varphi ij}{1-\varphi ij}\right) = \beta_{0j}.$$

$$\text{Level 2}: \ \beta_{0j} = \gamma_{00} + u_{0j}.$$

RESULTS

Figure 1 presents the percentage of men and women aged 25 to 34 in each country that has completed university education in the year 2006. First, it is clear the percentage of individuals who completes tertiary education variables greatly across countries. Less than 20% of men and women complete higher education in Austria, compared to more than 35% in Belgium, Denmark, and France. Second, in all countries except Switzerland, a higher percentage of young women complete tertiary education than young men. However the size of this gap varies greatly across countries.

FIGURE 1 HERE

Figure 2 presents the data from Figure 1, re-expressed as the female to male gap in completing higher education. Positive numbers represent a female advantage in university completion. In Switzerland, 11% more men complete university education than women. In Germany and Austria, roughly the same percentage of men and women complete university education. In the remaining 14 countries, women have a clear advantage over men in university completion, ranging from 4% more women completing higher education than men in Luxembourg and the Netherlands to 17% more women completing higher education in Finland.

FIGURE 2 HERE

Table 2 presents the hierarchical Bernoulli logistic model of university completion for all individual-level variables, and tests the effects of parent's education and mother's working during adolescence across 17 countries. Initially, the uncondonitial model was estimated, which does not include any independent variables, and demonstrated that university completion varies

significantly across countries. In all subsequent models, GDPC (positive and not significant) and gross tertiary enrollment (positive and significant) are included as controls, but not shown to preserve space (results available upon request).

TABLE 2 HERE

Model 1 shows that across countries, women complete significantly higher levels of university education than men. The female odds ratio is 1.52, indicating that women are 52% more likely than men to complete higher education across countries. Model 2 introduces the control variables: parent's education, parent's occupation, age, immigrant and minority status. As would be predicted by previous research, parent's education and occupation significantly increases the likelihood of completing higher education. Being an immigrant decreases the likelihood of completing higher education (immigrants are 27% less likely to complete higher education compared to native-born individuals). Age and minority status do not significantly affect university completion. After controlling for these background factors, women's odds of completing a tertiary degree increases. Women are 65% more likely to complete university than men.

Models 3 and 4 estimate whether one's mother or father having a university degree matters differently for young men or women. I create interaction variables between gender and mother's and father's university degree completion. According to gender-role socialization theory, one would expect that a mother having a tertiary degree would be more important for young women and a father having a degree would be more important for young men. However, this is not the case. Model 3 shows that a mother having a college degree does not significantly affect women more than men. Model 4 shows that a father having a college degree affects women more than men, contrary to expectations. The interaction between female and father

completed college is significant and positive. For men, having a father with a college degree increases the likelihood that they completed university by .93 (in terms of odds ratios, having a father with a degree increases men's odds of completing college by 153%). For women, the effect is even larger (father completed college (.93) + female*father college (.19) = *b*= 1.12). In terms of odds ratios, this result means that having a father with a college degree increases the odds of women completing college by 173%, which s significantly higher than the effect for men.

One plausible explanation for why fathers impact young women's education more than young men's could be that parents are less likely to gender stereotype their children than in the past, especially among highly educated men. Highly educated parents have more egalitarian attitudes towards their children and try to provide equal opportunities for educational success for both sons and daughters (Thornton, Alwin, and Camburn 1983; Buchmann and DiPrete 2006). Fathers may push both daughters and sons for success. Or it is possible that highly educated fathers may actually push their daughters more than their sons to help prepare daughters for future discrimination in the education system or labor market, and prepare them to be financially independent.

Model 5 assesses the effect of having a mother working during adolescence on young men's and women's likelihood of college completion. Having a mother who works may send a strong signal to young women about gender-role socialization and expectations about their future work, encouraging them to attain higher education. Having a working mother during adolescence has a significant, negative effect on the likelihood of young men completing university (b= -0.25, or an odds ratio of 0.77). In contrast, having a working mother has a significant, positive effect on the likelihood of young women completing university (mother

working (-0.25) + female*mother working (0.46)= b = 0.21, or an odds ratio of 1.36). Having a working mother decreases young men's odds of completing university by 23% and increases young women's odds of completing university by 36%.

Table 3 presents the hierarchical Bernoulli logistic model of university completion for all country-level variables. Model 1 tests the effects of national-level norms about marriage and family for men and women through cross-level interactions. The interaction between female and the crude divorce rate is significant and positive (0.35). The greater number of divorces in a country decreases the likelihood that men complete college (-0.35). For women, higher divorce rates has an effect of zero (divorce rate=(.035) + female*divorce rate (0.35)=b=0.00). This suggests that for men, higher levels of divorce decrease the likelihood that they will complete college, but for women, this negative effect does not exist. There is also a significant difference between the effect of fertility rates for men and women. For men, the effect of higher fertility rates is negative (-0.15), but for women the effect is positive (-0.15+2.77=.2.62). Higher fertility rates decrease how much education men complete, but increase how much education women complete. Higher fertility rates suggest that women will be expected to have larger families, yet in countries with higher fertility rates, women are more likely to complete higher education. It is possible that young women do not perceive a problem with having a large family and having an university degree, or young women perceive large family sizes in the previous generation as undesirable, and pursued higher education in order to provide themselves with an alternative.

Model 2 tests the effects of the labor market on men's and women's university completion. The unemployment rate does not affect the amount of education women and men receive. The percent of the labor market that works in services increases the likelihood that individuals will complete college, but this effect does not differ for men and women. The

percent of labor market that works in industry decreases the likelihood that individuals complete higher education, and this effect is more negative for women then men. For men, a one percentage increase in the number of individuals in a country who work in industry decreases their odds of completing university by 5%. Women's odds of completing university decrease by 12%. A labor market with a larger industrial sector may have less demand for educated workers, which may decreases the incentives for young people to pursue higher education, but it appears that the incentives are suppressed more for women than men.

Model 3 tests the effects of gender role ideology and women's status on men's and women's likelihood of completing higher education. Women's participation in parliament and gender role ideology does not affect whether women or men complete higher education. Women's participation in the labor market has a negative effect on university completion for men and a positive effect on university completion for women. An increase in the percentage that women are at parity with men in the labor market decreases the odds that men will complete college by 5% but increases the odds that women will complete college by 6%. For young women, being closer to parity with men in the labor market may suggest that earning a tertiary degree will pay off in the future.

DISCUSSION & NEXT STEPS

This paper examines how individual- and national-level factors affect young men's and women's university completion across 17 European countries. I find that for young women, having a father with a university degree and a mother that worked outside the home during adolescence increases their likelihood of completing a tertiary degree compared to men. Additionally, living in a country with higher fertility rates and a more equal share of women

participating in the labor market compared to men, increases women's odds of university completion, while it decreases men's odds of completion. Higher divorce rates decrease men's odds of completing a degree, but this negative effect does not exist for women. A larger percentage of a country's labor market that works in the industrial sector decreases both men's and women's likelihood of completing university, but at a greater rate for women than men.

The next steps in this project will further develop the theoretical contributions of this research, will attempt to expand the analysis to include older cohorts of men and women (35-44 year-olds, and 45-54 year-olds), and determine if additional country-level measures representing marriage and family norms, labor market characteristics, and gender role ideology and women's status can be identified and tested. Additionally, the European Social Survey is conducted biannually and additional countries are available in alternative waves. I hope to use these waves to add more European countries to my analysis, which will strengthen the generalizability of the results. Expanding this paper to include more cohorts, additional measures and countries will hopefully bolster my findings and our understanding of the changing nature of men's and women's educational attainment.

This paper contributes to the study of changing gender inequalities in education and provides important insights to researchers and policymakers as they grapple with the rapid changes occurring in women's and men's educational attainment around the world. The reversal in the gender gap in educational attainment, which now favors women in most countries, is an understudied phenomena. While scholars have begun to explain this trend in the United States (Buchmann and DiPrete 2006; DiPrete and Buchmann 2004) and are documenting it in other countries (Sundstrom 2004), this is one of the first studies that explores how both individual and national-level factors shape the gender gap in university completion across countries. Given the

potentially dramatic implications of women's rising educational attainment compared to men's for women's and men's status and quality of life around the world, this research is important for future research on gender inequalities. While it remains to be seen how women's and men's status may change due to women's rising educational attainment, the findings of this paper illuminate national-level causes of this remarkable change.

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Table 1: Descriptive Statistics for All Variables

	Mean	SE
Dependent Variable		
Completed University Education	0.26	...
Individual-level Indicators		
Female	0.53	...
Parent's Education	2.77	1.56
Parent's Occupation	4.05	2.33
Age	29.67	2.86
Immigrant Status	0.06	...
Minority Status	0.04	...
Mother Completed College	0.11	...
Father Completed College	0.15	...
Mother Worked	0.63	...
Individual-level N	4,365	
Country-level Indicators		
GPDC	12382.35	4181.224
Gross Tertiary Enrollment	28.06	9.61
Crude Divorce Rate	1.87	0.67
Fertility Rate	1.69	0.19
Percent in Industry	22.92	6.01
Percent in Services	65.87	11.17
Unemployment Rate	5.93	3.99
Female Labor Force Participation	42.39	5.07
Female Parliament Participation	26.05	19.78
Gender Role Ideology	0.11	0.42
Country-level N	17	

Table 2: Hierarchical Bernoulli Logit Models of University (ISCED 5 or 6) Completion; Individual-Level Variables

	Model 1	Model 2	Model 3	Model 4	Model 5
Individual-Level Variables					
Female	0.42 ***	0.50 ***	0.43 **	-0.01	0.21
	(.13)	(.15)	(.15)	(.19)	(.12)
Parent's Education		0.45 ***	'---	'---	0.45 ***
		(.06)	'---	'---	(.05)
Parent's Occupation		0.13 ***	0.23 ***	0.17 ***	0.13 ***
		(.03)	(.03)	(.03)	(.03)
Age		0.03	0.02	0.02	0.03
		(.02)	(.02)	(.02)	(.02)
Immigrant		-0.31 *	-0.37 *	-0.36 *	-0.29 *
		(.13)	(.17)	(.15)	(.12)
Minority Status		0.17	0.06	0.10	0.15
		(.20)	(.22)	(.20)	(.20)
Mother Completed College			0.91 ***		
			(.22)		
Father Completed College				0.93 ***	
				(.14)	
Mother Worked at Age 14					-0.25 *
					(11)
Individual-Level Interactions					
Female*Mother College			0.25		
			(.19)		
Female*Father College				0.19 **	
				(.06)	
Female*Mother Worked					0.46 ***
					(.11)
Intercept	-0.99 ***	-1.17 ***	-1.18 ***	-1.22 ***	-1.01 ***
	(.15)	(.13)	(.13)	(.11)	(.14)

Note: Standard Errors in Parentheses. Country-level N=17. Individual-level N=4,635; population-average models with robust standard errors.

All models control for GDPC and Gross Teritary Enrollment

*p<.05.

**p<.01.

***p<.001 (two tailed tests).

Table 3: Hierarchical Bernoulli Logit Models of University (ISCED 5 or 6) Completion; Country-Level Variables

	Model 1	Model 2	Model 3
Individual-Level Variables			
Female	0.52 ***	0.51 **	0.54 ***
	(.11)	(.14)	(.12)
Country-Level Variables			
GDPC	0.00	-0.00	-0.00
	(.00)	(.00)	(.00)
Gross Tertiary Enrollment	0.03 **	0.01 **	0.03 **
	(.01)	(.01)	(.01)
Crude Divorce Rate	-0.35 *		
	(.013)		
Fertility Rate	-0.15		
	(.58)		
Percent in Industry		-0.05 ***	
		(.01)	
Percent in Services		0.02 *	
		(.01)	
Unemployment Rate		0.03	
		(.03)	
Female Labor Force Participation			-0.05 *
			(.02)
Female Parliament Participation			-0.08
			(.01)
Gender Role Ideology			0.93
			(.48)
Country-Level Interactions			
Female*Crude Divorce Rate	0.35 *		
	(.15)		
Female*Fertility Rate	2.77 ***		
	(.68)		
Female*Percent in Industry		-0.07 *	
		(.03)	
Female*Percent in Services		-0.05	
		(.01)	
Female*Unemployment Rate		-0.05)	
		(.03)	
Female*Female Labor Force Participation			0.11 **
			(.03)
Female*Female Parliament Participation			0.41
			(.30)
Female*Gender Role Ideology			0.01
			(.01)
Intercept	-1.01 ***	-1.17 ***	-1.01 ***
	(.14)	(.06)	(.14)

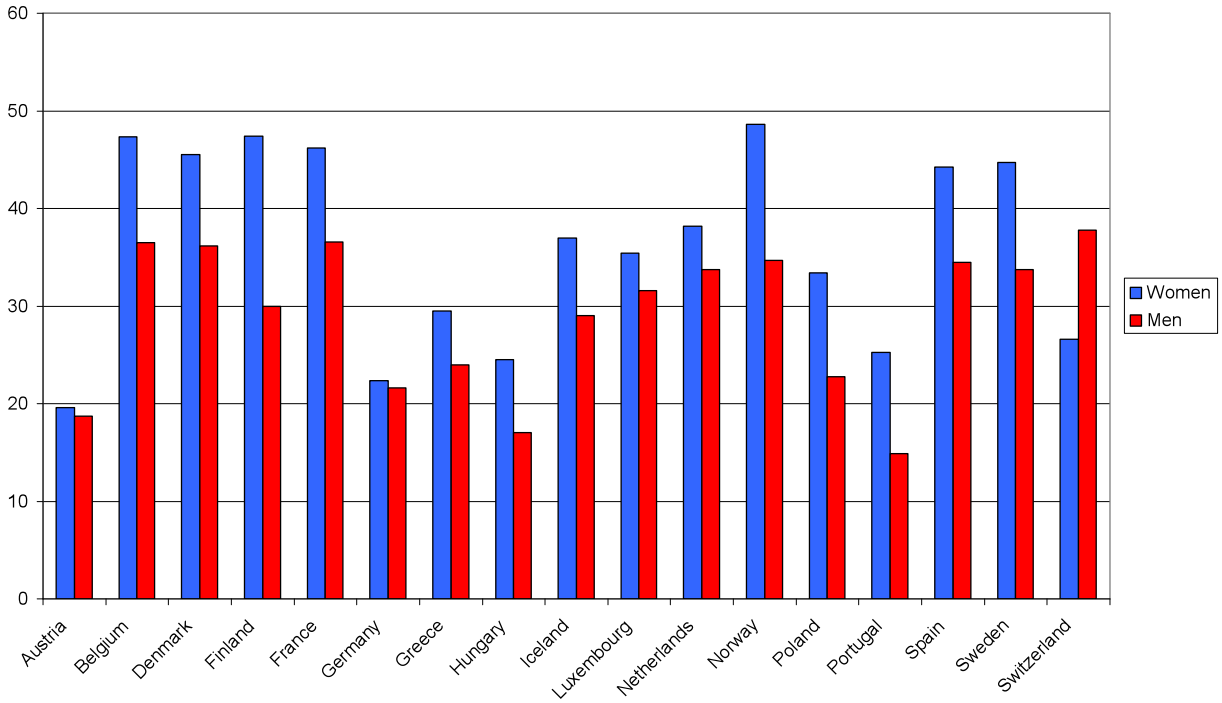
Note: Standard Errors in Parentheses. Country-level N=17. Individual-level N=4,635; population-average models with robust standard errors. All models control for parent's education, parent's occupation, immigrant status, minority status and age.

*p<.05.

**p<.01.

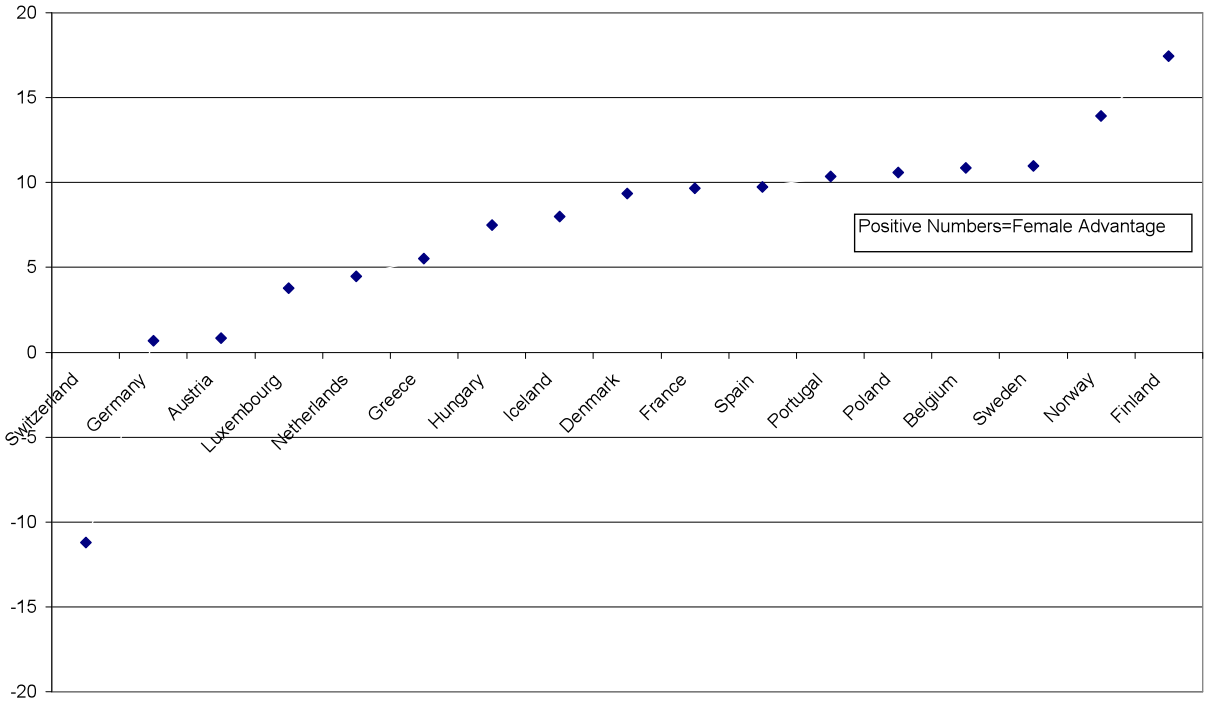
***p<.001 (two tailed tests).

Figure 1: Percentage of 25-34 Year-Olds Completing University Education, by Gender, 2006



Source: OECD 2008

Figure 2: Female-Male Gap in Completing University Education, 25-34 Year-Olds, 2006



Source: OECD 2008